# GLAB 330.2.2 - Standard Deviation

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**Introduction:**

**Standard Deviation** **(*σ*)** in statistics, typically denoted by **σ**, is a measure of how much a data set varies (dispersion) between values in a set of data. The lower the standard deviation, the closer the data points tend to be to the mean (or expected value), **μ**. In this lab, we will demonstrate how to calculate the standard deviation.

## Learning Objective:

By the end of this lab learners will be able to calculate the standard deviation.

**Given Dataset**

Imagine that we have the following data set representing the **number of cities travel by six friends in a month:**

|  |
| --- |
| **Number of cities (X)** |
| 7 |
| 8 |
| 5 |
| 4 |
| 6 |
| 5 |
| 4 |
| 9 |

**Instructions:**

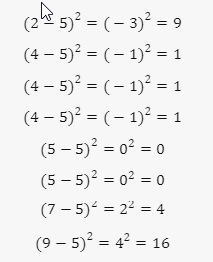
Here are the steps to calculate the standard deviation:

1. **Calculate the mean (average) of the data set:**



**X = 7 + 8 + 5 + 4 + 6 + 5 + 4 + 9 / 8 = 48 / 8 = 6**

1. **Calculate the squared differences from the mean for each data point:**

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**(7-6)2 = (1)2 = 1**

**(8-6)2 = (2)2 = 4**

**(5-6)2 = (-1)2 = 1**

**(4-6)2 = (-2)2 = 4**

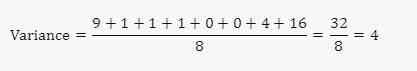
**(6-6)2 = (0)2 = 0**

**(5-6)2 = (-1)2 = 1**

**(4-6)2 = (-2)2 = 4**

**(9-6)2 = (3)2 = 9**

1. **Calculate the average of these squared differences (variance):**

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**X= 1 + 4 + 1 + 4 + 0 + 1 + 4 + 9 = 24 / 8 = 3**

1. **Take the square root of the variance to get the standard deviation:**

## 

**Standard Deviation = √3 = 1.73**

The standard deviation of the number of books read by these students is **2**. This means that on average, the number of books read by each student deviates from the mean by **2** books.

**Canvas Submission Instructions:**

* Upload your project to your GitHub account without setting it to private.
* Utilize the `README` file for any necessary additional instructions.
* Incorporate suitable comments throughout your project.
* Share the GitHub link on Canvas by clicking on the "Start Assignment" button located in the top-right corner of the Assignment page.